IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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| Applicants | : Hiroko Ueda et al. | Art Unit | : 1796 |
| Serial No. | : 10/565,324 | Examiner | : Darcy D Laclair |
| Filed | : January 20, 2006 | Conf. No. | : 2203 |
| Title | : Water-absorbent Resin Composition And Method For Producing Thereof, And Absorbent Material And Absorbent Product Using Thereof | | |

**MAIL STOP APPEAL BRIEF-PATENTS**
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

BRIEF ON APPEAL

**(1) Real Party in Interest**

Nippon Shokubai Co., Ltd.

**(2) Related Appeals and Interferences**

None known

**(3) Status of Claims**

Claims 1-28 are pending. See Appendix of Claims. They stand rejected on multiple grounds.

All of the pending claims are being appealed.

**(4) Status of Amendments**

Subsequent to the final Office Action dated July 14, 2009 ("final Office Action"), Appellant only amended claims 1, 8, and 10 to each include a limitation recited in both claims 27 and 28 and cancelled claims 27 and 28. In the subsequent advisory action dated January 19, 2010 ("Advisory Action"), the Examiner refuses to enter the amendments to claims 1, 8, and 10 on the ground that they "raise new issues that would require further consideration and/or search." See item 3(a).

**(5) Summary of Claimed Subject Matter**

Appellant's claimed subject matter relates to a water-absorbent resin composition. More specifically, independent claim 1 covers a water-absorbent resin composition containing a resin and a Zn-Si/Al oxide complex, independent claim 8 covers an absorbent material containing a resin, a hydrophilic fiber, and a Zn-Si/Al oxide complex, and claim 10 covers a method for producing water-absorbent resin composition by mixing a resin and a Zn-Si/Al oxide complex.

Support for claim 1 can be found in the specification at page 5, lines 15-25. Support for claim 8 can be found in the specification at page 5, line 29 through page 6, line 8. Support for claim 10 can be found in the specification at page 6, lines 13-21.

Claims 27 and 28, dependent from claims 1 and 10, respectively, were added in the response to a non-final office action dated December 31, 2008. Each of these two claims recites a mass ratio of the Zn content and the Si/Al content being 82/18-99/1. Support for this limitation can be found at page 5, lines 23-25 and page 66, lines 18-19. See also the "Argument" section.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The Examiner rejected claims 1-26 for obviousness over Takai, US Patent 6,284,362 ("Takai") in view of Yamada et al., European Patent 0,282,287 ("Yamada"). The Examiner also rejected claims 27 and 28 for failing to comply with the written description requirement and for obviousness over Takai in view of Tai et al. US Patent Application Publication 2003/0018114 ("Tai").

Appellant requests that all of the above grounds be reviewed on appeal.

**(7) Argument**

Claims 1-28 are rejected for anticipation on three grounds, each of which is addressed below:

I

The Examiner rejects claims 27 and 28 for lack of written description on the ground that the Zn:Si/Al ratio range "82/18-99/1" recited therein has no support in the specification. See the final Office Action, page 4, lines 3-7.

Claim 27 covers a composition containing a Zn-Si/Al oxide complex, in which the Zn:Si/Al ratio ranges from 82/18 to 99/1. Claim 28, on the other hand, is drawn to a process including adding a Zn and Si/Al complex, in which the Zn:Si/Al ratio ranges from 82/18 to 99/1.

In the response to the final office action, Appellant pointed out that (1) the specification describes a Zn:Si/Al ratio range of 50/50-99/1 and provides examples in which the ratio was 82/18 and (2) one skilled in the art, in view of the specification, would recognize that the inventors had possessed the claimed invention, in which the Zn:Si/Al ratio ranges from 82/18 to 99/1.

In the Advisory Action, the Examiner asserts that the specification only provides examples in each of which the Zn-Si/Al oxide complex constituted 0.1 or 0.5 parts by weight, relative to a claimed composition, and had a diameter of 0.36 μm. See page 4, line 14 through page 5, line 2. It appears to be her position that the specification does not support the new claims, which are not particularly limited to the relative weight and diameter of the Zn-Si/Al oxide complex.

Appellant disagrees and would like to point out that the specification describes that the Zn-Si/Al oxide complex is 0.001-5 parts by weight, relative to 100 parts of the resin, and the diameter of the complex is 0.001-1000 μm. See page 23, line 15 through page 24, line 9. One skilled in the art, in view of the specification, would understand that a Zn-Si/Al oxide complex having a relative weight and a diameter falling within the above ranges can be used to practice this invention. It follows that he or she, in view of the examples in which the Zn-Si/Al oxide complex having a relative weight of 0.1 or 0.5 and a diameter of 0.36 μm was used, would recognize that complexes with another relative weight and another diameter can also be used. In other words, the specification

including these examples fully supports the claims, even though they are not particularly limited to the relative weight and diameter of the Zn-Si/Al oxide complex.

Appellant would also like to draw attention again to *In re* Wertheim 541 F.2d 257, 191 USPQ (CCPA 1976). In that case, the claim at issue cover a process including, among others, concentrating a coffee extract to a solid level "between 35% and 60%," foaming the concentrated extract, and freeze-drying the foam. The original specification describes a range of "25%-60%," not "35%-60%." It also includes a specific example of "36%." Despite the fact that the specific example only embodied one instance for each of the parameters related to the claimed process (e.g., the foam density recited in claim 37 and freeze-dry temperature and pressure recited in claims 24 and 38), the court ruled that the new claim limitation to "between 35% and 60%," not even "between 36% and 60%," did meet the description requirement. The court found that "as a factual matter, persons skilled in the art would consider processes employing a 35-60% solids content range to be part of appellants' invention."

Like the specification in Wertheim, the instant specification describes a broad range of "50/50-99/1," which embraces the narrower range "82/18-99/1" recited in claims 27 and 28, and includes specific examples of "82/19," which is equal to the lower limit of the narrower range. Also like the specification in Wertheim, examples provided in the instant specification embody one or more instances for each of the parameters related to the claimed invention, such as the weight and diameter of the Zn-Si/Al oxide complex. In view of on these facts, "persons skilled in the art would consider processes [or compositions] employing [a 82/18-99/1 Zn/Si ratio] to be part of appellants' invention." Thus, pursuant to the Wertheim decision, the instant specification provides sufficient written description for the 82/18-99/1 recited in claims 27 and 28.

**II**

The Examiner rejects claims 1-26 for obviousness over Takai in view of Yamada. See the final Office Action, page 5, lines 8-9. Independent claims 1, 8, and 10 will be discussed first.

Claim 1 covers a water-absorbent resin composition that contains an absorbent resin and a Zn-Si/Al oxide complex and has a capacity (absorption capability) of absorbing a 0.90 mass% sodium chloride solution at the amount of not less than 20 g/g.

Takai teaches a water-absorbent composition containing a hydrogel resin capable of absorbing more than 25 g/g physiological salt (i.e., an absorption capability higher than 25 g/g) and an inorganic metal oxide microfiller. The microfiller can be an oxide of silicon, aluminum, iron, titanium, magnesium, or zirconium. Unlike claim 1, this reference does not teach or suggest using a Zn-Si/Al oxide complex.

Yamada teaches a combination of a polymer absorbent power and a metal oxide deordorant made of $SiO_2$, ZnO, and optionally $Al_2O_3$. See page 4, lines 11-13. Unlike claim 1, this reference does not disclose a composition having an absorption capability not less than 20 g/g.

Neither Takai nor Yamada teaches or suggests the features required by claim 1, i.e., (1) a Zn-Si/Al oxide complex and (2) an absorption capability not less than 20 g/g. Thus, claim 1 is not rendered obvious by Takai and Yamada.

Appellant now turns to independent claims 8 and 10. Claim 8 covers an absorbent material. Claim 10 covers a method for producing water-absorbent resin composition. Like claim 1, it requires (1) a Zn-Si/Al oxide complex and (2) an absorption capability not less than 20 g/g. As discussed above, neither Takai nor Yamada teaches or suggests both features required by claim 8 and 10. Thus, claims 8 and 10 are not rendered obvious by Takai and Yamada.

For the same reasons set forth above, claims 2-7, 9, 11-21, 23, and 24 (all dependent from claim 1), claim 22 (dependent from claim 8), and claims 25 and 26 (both dependent from claim 10), are also not rendered obvious by Takai and Yamada.

**III**

The Examiner rejects claims 27 and 28 for obviousness over Takai in view of Tai. See the final Office Action, page 5, lines 12-13.

Claim 27, dependent from claim 1, is discussed first. This claim covers a water-absorbent resin composition that contains an absorbent resin and a Zn-Si/Al oxide

complex. The mass ratio of the Zn content to the Si/Al content ranges from 82/18 to 99/1.

As discussed above, Takai does not teach or suggest using a Zn-Si/Al oxide complex, let alone the unique ratio required by claim 27.

Tai discloses a deodorizer that can be used in a resin composition. The deodorizer contains a Zn compound and a Si/Al compound. Referring to paragraph 0182, the Examiner asserts that Tai teaches the weight ratio of the Zn compound to the Si compound ranges from 1:5 to 5:1, overlapping the 82/18-99/1 range recited in claim 27. She proceeds to contend that "case law holds that a prima facie case of obviousness exists where the claimed ranges and prior art ranges [] are close enough that one skilled in the art would have expected them to have the same properties." See the final Office Action, page 6, lines 15-18.

Appellant disagrees. The law is clear that:

> "Applicant can rebut a presumption of obviousness based on a claimed invention that falls within a prior art range by showing '(1) [t]hat the prior art taught away from the claimed invention...**or** (2) that there are new and unexpected results relative to the prior art.' *Iron Grip Barbell Co., Inc. v. USA Sports, Inc.*, 392 F.3d 1317, 1322, 73 USPQ2d 1225, 1228 (Fed. Cir. 2004)." MPEP 2144.05.III; emphasis added.

First, Appellant points out that Tai indeed teaches away from the range of 82/18-99/1 recited in claim 27. Paragraph 182 of Tai relied on by the Examiner discloses a broad range, i.e., 1:5 to 5:1, which slightly overlaps with the 82/18-99/1 (i.e., 4.55:1-99:1) range recited in claim 27. Yet, this paragraph further states that "[t]he ratio of the zinc oxide and the silicon dioxide is preferably 1:4 to 4:1 [i.e., 20/80-80/20], and more preferably 1:3 to 3:1 [i.e., 25/75-75/25]." In other words, Tai suggests the ratio of zinc oxide and silicon dioxide away from the recited 82/18-99/1 range. To this extent, Tai **teaches away** from the range recited in claim 27. Pursuant to the above-quoted MPEP guidance, the *prima facie* case of obviousness asserted by the Examiner has been successfully rebutted.

Second, Appellant points out that the claimed invention has an unexpected advantage over the prior art.

The specification describes 11 compositions denoted as Examples 1-11. See pages 66-69. All of these compositions contained Zn oxide and Si/Al oxide at the ratio of 82/18 or 91/10. In other words, they are all covered by claim 27. As shown in Table 2 on pages 76-77, all of these compositions had excellent deodoring effect, i.e., after 30 minutes of absorption, 6 ppm or much lower level of hydrogen sulfide remained in the residue. By contrast, the compositions denoted as Comparative Examples 5 and 6 contained Zn oxide and Si oxide at the ratio of 40/60. See pages 70-71. These two compositions are not covered by claim 27, but correspond to the Tai compositions, which may contain Zn oxide and Si/Al oxide at the ratio ranging from 1:5 to 5:1. They exhibited significantly lower deodoring effect. Also see Table 2. More specifically, 10.5 ppm and 8 ppm of hydrogen sulfide remained in the residue after absorption with these compositions for 30 minutes.

In short, the compositions covered by claim 27 more effectively absorbed hydrogen sulfide than those disclosed Tai, in which the ratio of Zn: Si/Al ranges from 1:5 to 5:1. Referring again to MPEP 2144.05.III, under this guidance, the *prima facie* case of obviousness asserted by the Examiner has been successfully rebutted by Appellant's showing of the above-discussed unexpected advantage.

Since neither Takai nor Tai teaches or suggests the Zn:Si/Al ratio range of 82/18-99/1 as required by claim 27, a combination of these two references does not render claim 27 obvious.

Appellant now turns to claim 28, which depend from claim 10. This claim covers a method for producing water-absorbent resin composition containing an absorbent resin and a Zn-Si/Al oxide complex. Like claim 27, it requires that the mass ratio of the Zn content to the Si/Al content range from 82/18 to 99/1.

As discussed above, neither Takai nor Tai teaches or suggests a Zn:Si/Al ratio range of 82/18-99/1. Thus, these two references, either taken alone or in combination, do not render obvious claim 28, which requires the above-mentioned unique feature.

In sum, claims 27 and 28 are non-obvious over Takai and Tai.

In view of the above remarks, Appellant submits that the rejections asserted in the final Office Action have been overcome and all of claims 1-28, as pending, are patentable.

Please apply all charges or credits to Deposit Account No. 50-4189, referencing Attorney Docket No. 60004-111US1.

Respectfully submitted,

Date: 3-12-10

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**(8) Claims Appendix**

1. A water-absorbent resin composition having the absorption capacity at 60 minutes toward 0.90 mass% sodium chloride aqueous solution under the pressure of 1.9 kPa not less than 20 g/g, comprising:

absorbent resin obtainable by polymerizing an unsaturated monomer having an acid group and/or a salt thereof; and

complex oxide hydrate containing zinc and silicon, or zinc and aluminum, wherein the complex oxide hydrate contains zinc as main metal component, and the mass ratio of the content of zinc and the content of silicon or aluminum is in the range of 50/50 - 99/1.

2. A water-absorbent resin composition according to claim 1, wherein the complex oxide hydrate is obtained by co-precipitation method in a solution containing a water-soluble zinc compound and a water-soluble silicon compound or in a solution containing a water-soluble zinc compound and a water-soluble aluminum compound.

3. A water-absorbent resin composition according to claim 1, wherein the separation ratio of the complex oxide hydrate from the water-absorbent resin in a swollen state is not more than 20%.

4. A water-absorbent resin composition according to claim 1, wherein the water-absorbent resin composition is in a granular state and contains particles exceeding 150 μm and not exceeding 850 μm in diameter in a proportion of not less than 90 mass% of all the particles and particles exceeding 300 μm in diameter in a proportion of not less than 60 mass% of all the particles.

5. A water-absorbent resin composition according to claim 1, wherein the mass ratio of the content of zinc and the content of silicon or aluminum is in the range of 60/40 - 99/1.

6. A water-absorbent resin composition according to claim 1, further comprising a plant component.

7. An absorbent material for sanitary product comprising:
the water-absorbent resin composition of claim 1 and hydrophilic fibers.

8. An absorbent material for sanitary product comprising:

water-absorbent resin obtainable by polymerizing an unsaturated monomer containing an acid group and/or a salt thereof,

hydrophilic fiber; and

complex oxide hydrate containing zinc and silicon, or zinc and aluminum, wherein the complex oxide hydrate contains zinc as main metal component, the mass ratio of the content of zinc and the content of silicon or aluminum is in the range of 50/50 - 99/1, and

the water-absorbent resin has the absorption capacity at 60 minutes toward 0.90 mass% sodium chloride aqueous solution under the pressure of 1.9 kPa not less than 20 g/g.

9. An absorbent product comprising:
the absorbent material of claim 7,
topsheet possessing permeability to liquid; and
backsheet possessing impermeability to liquid.

10. A method for producing water-absorbent resin composition comprising the steps of:

obtaining a water-absorbent resin having not less than 20 g/g of absorption capacity at 60 minutes toward 0.90 mass% sodium chloride aqueous solution under the pressure of 1.9kPa through a step of polymerizing an unsaturated monomer containing an acid group; and

mixing the water-absorbent resin and complex oxide hydrate containing zinc and silicon, or zinc and aluminum.

11. A water-absorbent resin composition according to claim 2, wherein the separation ratio of the complex oxide hydrate from the water-absorbent resin in a swollen state is not more than 20%.

12. A water-absorbent resin composition according to claim 2, wherein the water-absorbent resin composition is in a granular state and contains particles exceeding 150 μm and not exceeding 850 μm in diameter in a proportion of not less than 90 mass% of all the particles and particles exceeding 300 μm in diameter in a proportion of not less than 60 mass% of all the particles.

13. A water-absorbent resin composition according to claim 3, wherein the water-absorbent resin composition is in a granular state and contains particles exceeding 150 μm and not exceeding 850 μm in diameter in a proportion of not less than 90 mass% of all the particles and particles exceeding 300 μm in diameter in a proportion of not less than 60 mass% of all the particles.

14. A water-absorbent resin composition according to claim 11, wherein the water-absorbent resin composition is in a granular state and contains particles exceeding 150 μm and not exceeding 850 μm in diameter in a proportion of not less than 90 mass% of all the particles and particles exceeding 300 μm in diameter in a proportion of not less than 60 mass% of all the particles.

15. A water-absorbent resin composition according to claim 2, wherein the mass ratio of the content of zinc and the content of silicon or aluminum is in the range of 60/40 - 99/1.

16. A water-absorbent resin composition according to claim 3, wherein the mass ratio of the content of zinc and the content of silicon or aluminum is in the range of 60/40 - 99/1.

17. A water-absorbent resin composition according to claim 4, wherein the mass ratio of the content of zinc and the content of silicon or aluminum is in the range of 60/40 - 99/1.

18. A water-absorbent resin composition according to claim 11, wherein the mass ratio of the content of zinc and the content of silicon or aluminum is in the range of 60/40 - 99/1.

19. A water-absorbent resin composition according to claim 12, wherein the mass ratio of the content of zinc and the content of silicon or aluminum is in the range of 60/40 - 99/1.

20. A water-absorbent resin composition according to claim 13, wherein the mass ratio of the content of zinc and the content of silicon or aluminum is in the range of 60/40 - 99/1.

21. A water-absorbent resin composition according to claim 14, wherein the mass ratio of the content of zinc and the content of silicon or aluminum is in the range of 60/40 - 99/1.

22. An absorbent product comprising:
the absorbent material of claim 8,
topsheet possessing permeability to liquid; and
backsheet possessing impermeability to liquid.

23. A water-absorbent resin composition according to claim 1, wherein absorbent resin is surface crosslikned with a surface crosslinking agent at a temperature in the range of 100 to 250 °C.

24. A water-absorbent resin composition according to claim 23, wherein the surface crosslinking agent is a polyhydric alcohol.

25. A method for producing water-absorbent resin composition according to claim 10, further comprising surface crosslinking the water-absorbent resin with a surface crosslinking agent at a temperature in the range of 100 to 250 °C.

26. A method for producing water-absorbent resin composition according to claim 25, wherein the surface crosslinking agent is a polyhydric alcohol.

27. A water-absorbent resin composition according to claim 1, wherein the mass ratio of the content of zinc and the content of silicon or aluminum is in the range of 82/18-99/1.

28. A method for producing water-absorbent resin composition according to claim 10, wherein the mass ratio of the content of zinc and the content of silicon or aluminum is in the range of 82/18-99/1.

## (9) Evidence Appendix

None

## (10) Related Proceedings Appendix

None

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